



# **REGIONAL BRACKISH WATER RECLAMATION PROGRAM**

*A regional effort to create a new potable water supply and expand groundwater storage capacity through brackish groundwater desalination*



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## EXPANDING LOCAL WATER SUPPLY

The Regional Brackish Water Reclamation Program (RBWRP) seeks to reclaim the historical brackish (salty) water plume in the West Coast Groundwater Basin and create a new local drinking water supply.

### *Program Details:*

- Regional effort uses new groundwater extraction wells to desalinate water for distribution through local municipal drinking water systems.
- Capable of providing up to **10,000 acre-feet each year** of fresh, drinking-quality water to local water customers (**nearly 9 million gallons each day**)
- Removal of salty groundwater will **create available groundwater storage capacity** for excess local fresh water and recycled water. Local water providers will be able to store surplus water for use during dry years

### *Program Benefits:*



Increases local sustainability & resiliency



Protects groundwater quality for the future



Helps to alleviate drought impacts



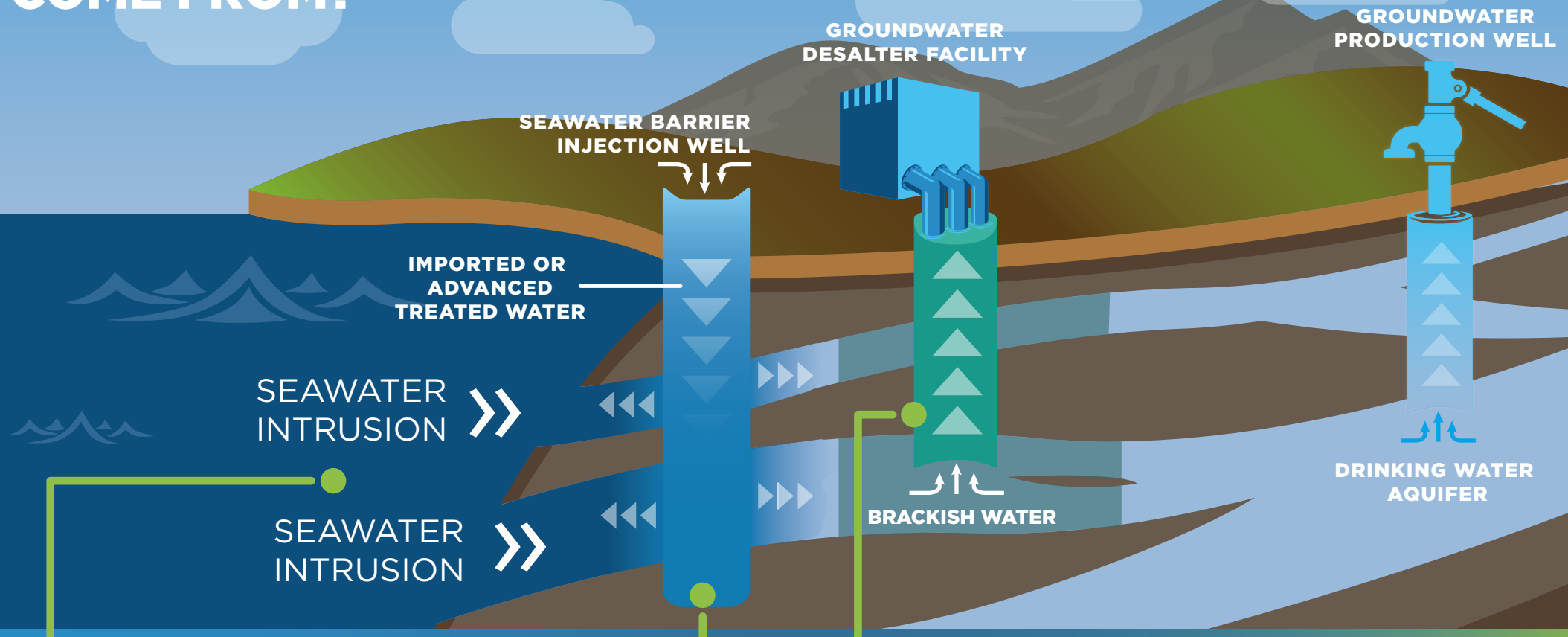
Assists local agencies in meeting long-term water supply needs

## TRIED AND TESTED

WRD's experience in brackish groundwater reclamation started with the Robert W. Goldsworthy Desalter. The desalter purifies extracted brackish groundwater using reverse osmosis technology and provides fresh, potable drinking-water to the City of Torrance residents.



# WHERE DOES BRACKISH GROUNDWATER COME FROM?



## 1 SEAWATER INTRUSION

- Groundwater over-pumping in the early 1900s lowered groundwater levels to below sea-level along the coast
- Salt water began to flow into or “intrude” into groundwater aquifers
- Fresh groundwater became “brackish” – too salty for drinking

## 2 SEAWATER BARRIER INJECTION

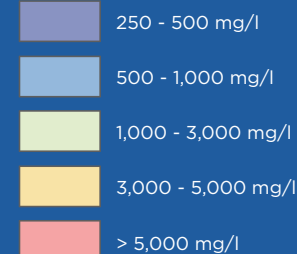
- Courts legally limited groundwater extraction after wells had to be abandoned due to salt
- Construction began on a water pressure “barrier” consisting of aligned freshwater injection wells along the coast
- The barrier now includes 153 total wells extending from LAX airport to the Palos Verdes Hills

## 3 BRACKISH WATER PLUME

- The injection wells blocked further seawater intrusion, but left a plume of brackish water trapped inland
- Before desalination, the brackish water plume limited groundwater usage as a local drinking water source

**ESTIMATED BRACKISH PLUME TOTAL VOLUME**  
 = 600,000 acre-feet  
 (20,000,000,000 gallons)

**2017 Saline Plume Concentrations for the Silverado Aquifer**  
 mg/l = milligrams per liter



West Coast Basin Barrier Project



# FEDERAL FUNDING

The Bureau of Reclamation (USBR) approved the feasibility study for the RBWRP, which makes it eligible for federal funding up to 25% of the total cost of the project. In addition, USBR already awarded the RBWRP \$4.9 million through a federal desalination program.

# DESALTER TREATMENT TECHNOLOGY

Groundwater desalination works primarily through the use of reverse osmosis treatment. Salty brackish groundwater extracted from wells is pressurized and forced through reverse osmosis membranes to remove the salts. The water is then disinfected and the pH level is adjusted to create fresh, potable drinking water.

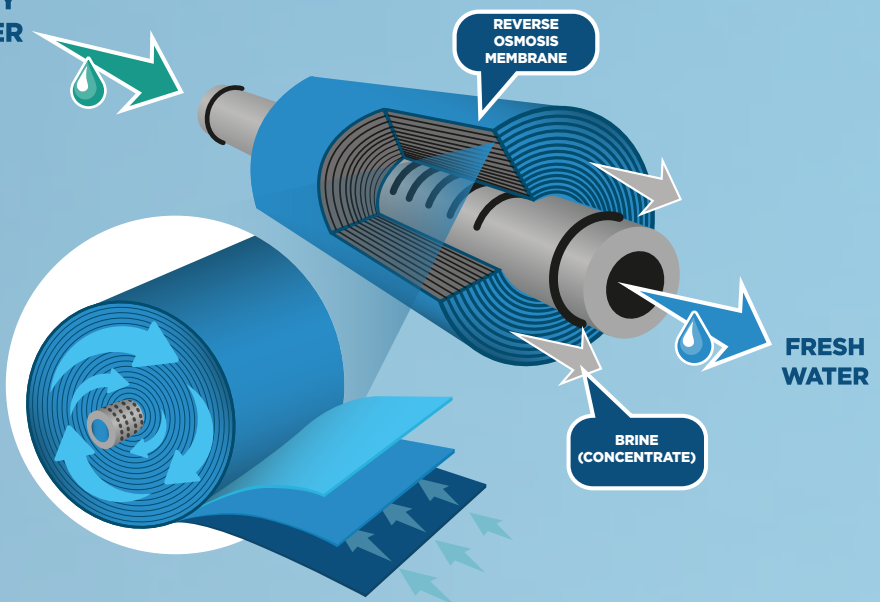


## REVERSE OSMOSIS

Reverse osmosis treatment uses tightly-wound thin membranes to filter out salts, ions, and fine particulate matter. The water is treated at the molecular level, as only water molecules are small enough to pass through the membranes.



**SALTY WATER**





# ABOUT WRD

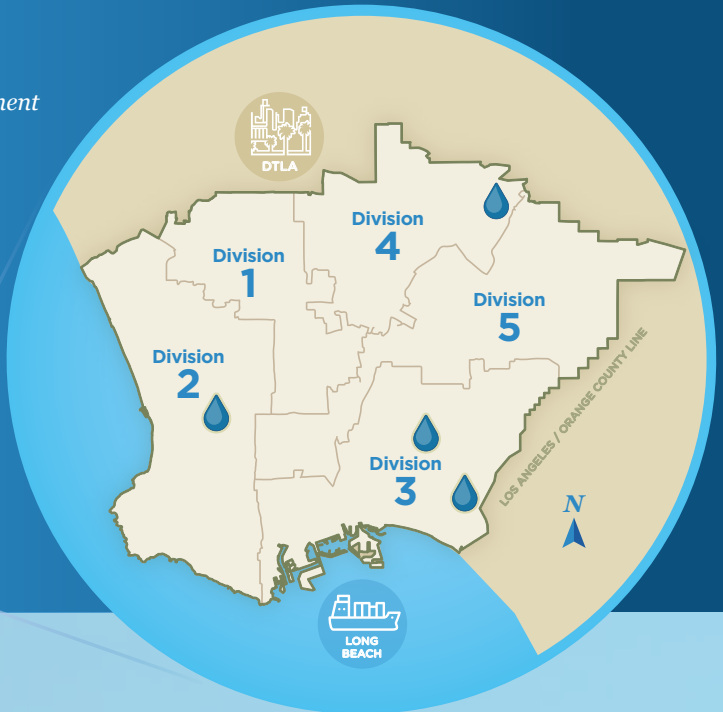
The Water Replenishment District (WRD) was established in 1959 to manage, protect, and replenish the Central and West Coast Groundwater Basins. WRD achieves its mission by:

- » Using effective and environmentally sound basin management practices and serving as the Administrative Body of the Watermaster for both basins
- » Monitoring and remediating the groundwater basins affected by natural and human-made contaminants
- » Owning and managing two advanced water treatment facilities and a groundwater desalter

*WRD manages and protects two of the most utilized urban groundwater basins in the nation. Groundwater from these basins provides nearly 50% of the total water supply for the four million residents in WRD's 43-city service area which covers 420 square miles in southern Los Angeles County. WRD ensures that a reliable and locally sustainable supply of high-quality groundwater is available through replenishment with recycled water and stormwater capture.*

The Water Replenishment District's service area in southern Los Angeles County

 = WRD Facility



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